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E P I L E P S Y.

Perhaps no subject in Medicine has attracted greater attention throughout all ages even from the days of Hippocrates than that of epilepsy.

Although this thesis is mainly concerned with epilepsy in its relation to insanity, it may here be noted that some of the most prominent figures in history, to name only Mahomet, Paul of Tarsus, Julius Caesar and Napoleon Bonaparte, are said to have been sufferers from this disease without its affecting their genius or power. In these cases one is inclined to agree with Savage, who in speaking of the two latter, says that although they may have had fits of some kind occasionally, they do not deserve to be classed as chronic or habitual epileptics. History, however, seems to contradict the opinion we now-a-days so frequently hear expressed that no epileptic should have his liberty and live free from control, but experience teaches us that to exercise a certain amount of supervision over such sufferers is always expedient, in case that latent insanity may suddenly become kinetic. The establishment of epileptic Colonies has been a useful step in this direction.

It is to be expected that in such an ancient and well known disease as epilepsy many forms have been described. These, perhaps, may best be dealt with under the heading of etiology.

Most writers are agreed that in the majority of cases the disease begins before puberty, that in children the frequency of its occurrence varies little with sex, but that after puberty it is much more common in the male sex. This coincides with my own observations among insane epileptics made during the last eleven years.

In the Warwick County Asylum at present the % of male and female epileptics is 18.5 of the former to 12.05 of the latter of all patients in residence.

On reference to the fifty-seventh report of the Commissioners in Lunacy we find that for the five years 1897 - 1901 inclusive, the percentage of male epileptics was 8.8 and of females 6.4 of all patients admitted to pauper Asylums in England and Wales.

In Sieveking and Reynolds experience they found the disease rather more prevalent in the female sex. Gowers,[2] in his analysis of 3000 cases, found that 13 females suffer to every 12 males.

I do not think that a direct epileptic heredity is as important a predisposing cause as do some,

but am certainly of opinion that this disease more frequently occurs in those persons who have a neurotic family history, although not necessarily one of epilepsy, than in those who are happy in the possession of a sound one. An epileptic parent may have children who may be insane, idiotic, markedly hysterical, passionate, or epileptic, just as a parent whose neurosis may have shown itself in some other form may do so. The former is not necessarily more likely to have epileptic offspring than the latter. Acute and chronic alcoholism in the parent I hold to be a potent predisposing cause of this disease in the children. Among the poorer class the marriage festivities often resulting in the intoxication of the husband during the first few days of wedlock, have been held responsible for the birth of an epileptic and often idiotic child, the later members of the family often proving to be of average intelligence. The fact that the village idiot is generally the eldest child (irrespective of sex) has been thus accounted for. I have known a family of four sons, the father being a capable and energetic business man, the mother an alcoholic. Three of the sons were epileptic and died of this disease, combined

with chronic alcoholism, before the age of thirty five. The two elder were subject to epileptic fits and the younger to attacks of petit mal before they began to drink to excess. The fourth was also a confirmed alcoholic and committed suicide while suffering from General Paralysis of the Insane soon after reaching a like age. He also suffered from convulsions at times which may have been of syphilitic origin (they were not like the ordinary seizures seen in General Paralysis) a history of this disease being clearly traceable in his case.

Fournier believes that secondary syphilis may cause a pure neurosis such as epilepsy. I have never been able to satisfy myself as to this fact.

Undoubtedly convulsive seizures due to acquired syphilitic disease of the brain are common. If one be dealing with a man, say over thirty, who complains of fits which have only come on recently it is always advisable to combine the iodide of potassium with any bromide which may appear to be indicated.

I have seen some excellent results follow this mode of treatment, a rapid recovery from the seizures taking place. Uraemic convulsions and those due to certain poisons such as lead, are closely

allied to epilepsy.

Epileptic convulsions due to chronic alcoholism (the so-called drink convulsions) have received scant attention, even in the most recent text books. They may occur in steady drinkers and in a number of cases I have known attacks of delirium tremens or mania a potu ushered in by a severe epileptic seizure occurring in persons who were never before known to have had a fit.

Some modern authors believe that fright has been over-estimated as an existing cause of epilepsy. M. Allen Starr[3], however, gives it as the alleged cause in 119 out of 2000 cases of epilepsy studied by him. We are all familiar with the Mother's oft-told tale of her little girl who was frightened by the small boy who jumped out on her in the dark, causing her ever afterwards to have fits, but the following case, which has been under my observation for many years, seems to me to be of interest in this connection. A labourer, aged 35, was admitted to this Asylum on June 16th 1884. The notes taken on his admission state - "Some years ago patient was working in a mill with a fellow labourer, when by an accident to the machinery the latter was killed.

The sight of the mangled corpse took a permanent effect on patient and he shortly afterwards became epileptic. During one epileptic attack a few days ago he attempted to jump through a window sustaining a severe scalp wound. His fits are said to be frequent and very severe."

At the present time he works usefully on the farms, but is subject to numerous severe epileptic seizures at which times he becomes noisy, abusive, quarrelsome and violent.

Trauma may be found in certain cases. One which occurs to my mind is that of a gamekeeper who was struck over the head in a poaching affray and afterwards became the subject of epilepsy. He was an inmate of this Asylum for nearly seven years and became very helpless and entirely confined to bed during the last few years of his life. Previously to this assault he had enjoyed perfect health and had been entirely free from any form of convulsive seizure.

By a strange coincidence, or an act of poetical justice, a few hours before his death from epilepsy and exhaustion (he died in a "status epilepticus") the poacher accountable for his injuries so

many years previously was shot dead by a gamekeeper in a poaching affray within a few miles of this institution.

Osler[4] considers a group depending upon local disease of the brain existing from childhood, as seen in the post-hemiplegic epilepsy, to be of importance and also mentions cases occasionally following the infectious fevers. Gowers states that scarlet fever has a remarkable influence in the causation of epilepsy.

Masturbation as a potent factor in the causation of the grand mal, I believe to be rare. In private practice I have seen slight attacks of petit mal in adolescents due entirely, in my opinion, to excessive indulgence of this vice. The youth becomes morbidly self conscious and shy, is nervous and blushes on the slightest provocation, his hands are moist and clammy, he shuns society and is fast becoming a "slacker". There may be pain in the back, which, when associated with a slight amount of albumin in the urine, may suggest some renal trouble. He seeks to avoid looking one in the face, but a most important diagnostic point is the almost constant state of dilatation of both pupils.

Such a patient some years ago described to

me how he frequently fell into a dreamy state and became, as it were, for some seconds or longer only an "onlooker" in connection with any act or conversation in which he might be engaged. He married at an early age and is now a happy and contented husband and father.

Such cases rarely, I am pleased to imagine, come under the care of the alienist.

Convulsions in young children may be produced by any reflex irritation, such as that caused by worms or dentition, a tight prepuce, a foreign body in the nose or ear, or some irritating substance lodged in the intestine. Should removal of such reflex causes not permanently cure these seizures, as it may fail to do in certain cases with a direct neurotic history, the condition then becomes inseparable from that of epilepsy. Rickets is a great cause of convulsions in children, particularly in families with an epileptic tendency. If the fits do not cease when the signs of rickets have disappeared, the child must be regarded as an epileptic.

Osler mentions the case of a man with an undescended testicle, pressure on which would always cause a typical fit and the removal of which ef-

fected a cure.

Constipation and indigestion (the latter in Asylum patients often due to the eating of rubbish), neuromata, cicatrices and tumours involving peripheral nerves, ovarian and uterine irritation in the female and the act of coitus or masturbation in the male are often the existing causes of fits in those prone to such seizures. In female epileptics the fits are often most numerous just before or during menstruation; or excitement, irritability and restlessness may become more marked at this period when the convulsive seizures are not increased.

I have frequently seen an epileptic fit occur in idiots, imbeciles and chronic dements, who have been resident in an asylum for many years and who had no previous history of such attacks. The fit, which is generally a very severe one, may prove to be a solitary seizure or may be followed by others at longer or shorter intervals. In the former case it may be due, I think, to some reflex irritation causing an explosive discharge of nerve energy in a patient who is in a state of unstable mental equilibrium. In the latter I agree with Clouston[5] that it is due to advance of disease from the mental into the moter centres of the brain.

Ogle has described cases of epileptiform (better, I think, described as "epileptoid") attacks in which the Stokes-Adam Syndrome was present and which were due to advanced arterio-selerosis.

During the last eight or nine years Agostini, Krainsky, Ceni and others have advanced the theory that so-called idiopathic epilepsy is caused by auto-intoxication by abnormal products, of the nature of leucomaines, developed in the gastro-intestinal canal and Ford Robertson[6] is of opinion that their investigations into chemical pathology are of such value as to make it practically certain that the disease is one that we shall yet be able to arrest in the great majority of cases. "To-day", he says, "we stand within measurable distance of one of the greatest triumphs of medical science. There is good reason to be confident that this triumph will not be long delayed." The modern physician looks upon the use of the term idiopathic as a confession of ignorance, but if we reject its use in all cases, we must recognise the importance of the predisposition (the result of a hereditary neurotic diathesis) to explosive discharges of nerve energy in certain individuals and relegate the auto-intoxication to its

proper position as an exciting cause only.

In my opinion the predisposing cause as the more important has been too much lost sight of by these authors and the exciting given an undue prominence.

It is interesting to compare chlorosis and epilepsy in this connection. Twenty years ago Sir Andrew Clark advanced the theory that the former disease was due to a "copraemia", an absorption of poisons, ptomaines and leucomaines, from the large bowel due to constipation. This theory is now generally rejected. Osler says that it has always appeared to him to be baseless considering the great frequency of constipation in women. Many now hold with Virchow that it is due to a defect in the circulatory and generative apparatus of the individual. But, I would ask, may not the absorption of abnormal products, the result of constipation, cause chlorosis in a girl with this defect (who otherwise might have escaped) just as a similar absorption of toxines from the gastro-intestinal canal may cause convulsions in a person with a predisposition to epilepsy? No one, I think, would assert that because a man occasionally suffers from gastro-intestinal disturbance he must necessarily become

epileptic, any more than that the ordinary constipated female must always suffer from chlorosis. But we see that Sir Andrew Clark's theory as to the causation of the latter disease is now looked upon as exploded, while the auto-intoxication theory of Agostini and other writers as to the causation of epilepsy is for the present very fashionable.

Let us now consider the symptoms of epilepsy. These may be studied under the head of (1) grand mal; (2) petit mal; (3) Jacksonian epilepsy.

The aura or localized sensation preceding the fit, when present, may be of many kinds. As the term (ἄυρα, a breeze) implies it may take the form of a draught of cold air felt in the extremities, head or other part of the body. Of these somatic aurae perhaps the most common are associated with the epigastrium, intestines, or with the head, the so-called pneumo-gastric aurae. Of psychical aurae my experience agrees with that of Hughlings Jackson that one of the most common is a sensation of strangeness, the patient sinking into a vague state, which I think may be considered as a stage of petit mal.

Occasionally one notices that the sensation is apparently one of terror. The aura may affect any of the special senses most commonly the visual in which flashes of light and sensation of colour occur. Olfactory and gustatory generally, of unpleasant smells and tastes, I have met with, but auditory auræ have not been common in my experience. The seeing of a definite object is rare. Affleck in his Clinique (Edinburgh Infirmary 1888) used to describe an aura in which the patient saw a little old woman in a red cloak who grew larger and larger as she approached him and then tapped him on the forehead with a crutch which she carried, when he uttered a cry and became unconscious. Some years afterwards I had a very similar case under my own care. This patient would see a man in a red coat who suddenly sprang out on him and struck him over the head with a hammer with which he was armed. In this case also the patient uttered a cry and then lost consciousness. It will be observed that in both these cases a colour sensation (red) was associated with an imaginary appearance of a definite figure. Sometimes the fit may be preceded by certain movements which may or may not be associated with an aura. At present I have under my care a

female epileptic who describes a distinct aura commencing in her left hand. She utters a loud cry and then begins to run with great speed and violent action for some time before falling down in a fit. She states that she has no recollection of anything which occurs after the commencement of the aura. To this form the term "epilepsia procursiva" has been given.

The epileptic cry although often sounding like the voice of one in abject terror is probably produced in a purely mechanical manner by a narrowing of the glottis at the moment when air is expelled from the chest by ~~some~~ tonic spasm.

The prodromal symptoms of an approaching attack of grand mal may last for hours or even days, and are readily recognised by those in constant association with a patient subject to these attacks, whether such patient may be at other times in normal relation to the world or not. They vary greatly, thus a person usually the subject of taedium vitæ may exhibit a marked bien être or vice versâ, while passionate outbursts, irritability and quarrelsomeness, or querulousness often associated with the complaint of imaginary bodily ailments are common.

The three stages of the fit in grand mal, Tonic spasm, Clonic spasm and coma need only be briefly referred to, as they are too well known to need description. The first stage lasts only a few seconds. I have seen death occur in this stage. The second rarely lasts more than a few minutes and during its progress the urine and faeces may be passed involuntarily. If prolonged an ejaculation of semen may take place in the male, due, I think, in some cases to the continued clonic spasm of the thighs. The third stage, that of coma, lasts for a variable time, after which the patient can be aroused, but if undisturbed he may sleep for hours.

The term "status epilepticus" is applied to that condition in which the fits occur in rapid succession, the patient passing from one into another without regaining consciousness. The pulse and respiration are often much increased in rate and there is marked hyperpyrexia. The latter is generally seen when the condition is about to prove fatal, a termination which frequently occurs. Gowers says that a status epilepticus is often caused by a sudden cessation in the administration of bromides. Although this, no doubt, is quite true, I have often seen it occur in patients who had been for a lengthened

period of time and were still taking large doses of this drug. Apparently this condition is much more frequent and fatal among asylum patients than among sane sufferers from epilepsy. I may here mention that I have often found excellent results follow the administration of full doses of Bromide and Chloral Hydrate by the bowel, when the patient is quite unable to swallow. This may be combined with brandy when there are signs of heart failure from exhaustion.

After a fit a patient may pass a large quantity of limpid urine in which albumin may be present. His reflexes may be absent or exaggerated. I have found the former to be the more frequent. Mentally he may become excited or, as in a case I have seen within the last few days, he may sink into a trance like condition. This patient lay in such a condition for over thirty six hours. He could not be induced to speak or swallow or perform any voluntary act, but lay passively in bed staring fixedly before him. He then had two more fits in rapid succession, after which he quickly returned to his usual mental condition. He remembered nothing that occurred while he lay in this trance like state. The possibility of

the committal of some automatic act of violence must not be lost sight of in such a case. This man, after another fit some twenty four hours later, became very violent and destructive and broke eight panes of glass.

A person may suffer from nocturnal epilepsy for years without knowing it. Trousseau says that when a person tells us that in the night he has incontinence of urine and awakes in the morning with headache and mental confusion, and complains of difficulty in speech owing to the fact that he has bitten his tongue; if also there are on the skin of the face and neck purpuric spots, the probability is very strong that he is a sufferer from this particular form of the disease.

Blood on the pillow is of diagnostic importance when the injury to the tongue is not of sufficient severity to impair the speech. Bristowe 7 mentions that a shoulder may be dislocated without the patient being able to account for it, and Trousseau records a case in which this accident was the first indication of the occurrence of nocturnal fits. Some thirteen years ago I met with a case in private practice in which a similar accident occurred twice during the twelve months that the patient was under my observation. During this time he had no epileptic seizure

during the day.

Petit mal is well described by Osler as epilepsy without convulsions. It is, I am convinced, far more common than is generally supposed, as many sufferers from this form in a mild degree enjoy otherwise good health and throughout their lives never have to seek the advice of the physician on this account. The simplest form is the condition to which I have before referred, in which the person sinks into a strange dreamy condition and in a manner loses his identity, but does not lose consciousness. The sensation that certain scenes have been witnessed or certain conversations heard before, which most of us have at times experienced, is to some extent, I think, allied to this condition. It does not follow, however, that those of us who have experienced this ~~condition~~ sensation must necessarily become epileptic any more than that occasional depression of spirits spells melancholia.

The condition to which the term petit mal is usually restricted is a transient unconsciousness which may come on at any time, accompanied or unaccompanied by a feeling of faintness or vertigo. A true aura is very rare (Osler).

I remember, in my student days, breakfasting with a friend who suddenly turned pale and ceased speak-

ing while in the act of raising his cup to his lips. He stared fixedly before him and his pupils rapidly dilated. This condition only lasted a few seconds and he then finished drinking his coffee and resumed the conversation. He had no knowledge of anything unusual having occurred. On my unthinkingly saying that I thought he had had an attack of petit mal he told me that two of his brothers, who were dead, had suffered from epilepsy. He himself suffered from convulsions in after years.

During an attack of petit mal the person usually drops anything that he may have in his hand and may sink to the ground. In some cases there is slight incoherency and confusion when he resumes speech or he may try to undress himself, walk in the opposite direction to that in which he was going, scratch his head, rub his face, or pull his moustache in a careless manner. Gowers mentions seventeen different manifestations of petit mal.

So-called masked epilepsy, the épilepsie larvée of Esquirol and Morel, is of the greatest medico-legal interest. Mercier[8] says that the most savage and purposeless crimes are committed towards the end of the preparoxysmal stage of epilepsy and in such cases there is not usually any actual fit. This is

the true épilepsie larvée of the French writers in which the maniacal violence takes the place of the fit.

Many authorities, Savage to name one, incline to the belief that the term masked epilepsy is generally a misnomer, as an attack of mental disorder hardly ever entirely replaces the fit although the latter may be so slight as to escape notice. They, I presume, would apply the term post-epileptic automatism to all such cases. Gowers thinks that although true masked epilepsy is certainly rare, it is doubtful whether we are justified in denying its occurrence. All are agreed that post-epileptic automatism is much more common after petit mal than after grand mal.

Trousseau and other French authors, and Orange and Savage in this country, have described most interesting and instructive cases of unconscious and mechanical acts taking place in this condition. These cases are, however, too well known to need quotation. There is little doubt that many criminal actions have been committed by persons while in a state of post-epileptic automatism.

Before quitting the subject of petit mal it may be noted that in most cases convulsions finally occur. In epileptic insanity attacks of petit and grand mal often alternate.

In Jacksonian, cortical, symptomatic or partial epilepsy as it is called, the symptoms are also too well known to need description here. In these epileptiform seizures (as Jackson named them) consciousness is never lost at the beginning, but may continue throughout or only be lost late in the attack. In my experience it is rare in asylum patients except in general paralytics. In sane patients there is always a fear that partial epilepsy may become general.

The cause is most commonly a coarse ~~tissue~~ lesion of the brain, as a tumour (very often specific), inflammatory softening, meningitis, haemorrhage, abscess or trauma. Anderson points out the loose way in which the term "epileptiform" seizures is often used by medical men to describe fits of a vague, indeterminate character, whereas epileptiform was the term used by Jackson to typify the seizure which is now generally known by his name and to distinguish it from epilepsy proper.

I would suggest that the term "epileptoid" should be used to define seizures which are neither true nor Jacksonian epilepsy.

Hystero-epilepsy, a disease so ably described by Charcot, I have not infrequently seen in female

epileptics.

In one case the patient was subject to severe attacks of grand mal and also to most interesting attacks of hysteria major. The sight of a dog was always sufficient to bring on an attack of the latter. She would start running in a violent and exaggerated manner, lifting her feet very high and trying to jump over any obstacles in her way. In a short time, half a minute or longer, she would stand still, throw back her head and utter a sharp, crowing cry and continue to make this noise for many minutes, during which time she would jerk her head backwards and forwards with the greatest rapidity and violence. To the onlooker it appeared that she must inevitably dislocate her neck, and I have often wondered that this accident never occurred. These movements were made with such rapidity that her features became almost indistinguishable and any effort to restrain them only led to an increase in their violence and duration.

Some female epileptics when recovering from an ordinary attack of grand mal may struggle, kick about them and weep in a hysterical manner, but this must not be confounded with true hystero-epilepsy, which I have known to happen.

Mercier points out that the epileptic idiot

is very like any other idiot, but that the epileptic imbecile is generally of larger growth and stronger build and more active generally than he of a like degree of mental enfeeblement who does not suffer from this disease.

Most authorities are agreed that although insanity and epilepsy are closely associated, we are not justified in saying that the former is caused by the latter all cases in which both exist. The same cause which gave rise to the one may give rise to the other in the individual as it may do in different members of the same family. But, as Ford Robertson says, when we bear in mind that the fits, which can hardly fail to be a cause of cerebral injury, are accompanied by a toxic condition of the blood and that the patient generally has an inherent predisposition to insanity, we cannot be surprised at mental deterioration ending in dementia occurring in some cases.

The subjects of epileptic mania are always some of the "enfants terribles" among asylum patients in all countries. They are irritable, quarrelsome, and impulsive and often exhibit a perverted religious emotionalism, but generally possess few Christian virtues. A redeeming feature in the character of

many is, however, a sympathy and friendship and endeavour to help fellow sufferers from their own particular affliction. Although the majority are untruthful, mischief-making and spiteful some few are of a likeable character, well conducted and industrious, in such cases the fits generally occurring at long intervals. Attacks of acute mania, which may be homicidal or suicidal, or both, may precede or follow the fit. The subject of masked epilepsy we have already considered. One of the most violently determined suicidal patients I have ever had under my care was a female epileptic. Her attacks of suicidal frenzy always preceded a fit. In the interval between the paroxysms the patient may appear to be slightly enfeebled mentally or melancholy, but suicidal impulses are rare in this state. Fixed delusions are also uncommon, although during the paroxysms delusions of suspicion and persecution and all forms of hallucinations are frequently met with. I have noticed obsessions in a few cases during the paroxysmal interval. While in this stage one woman always touches certain articles of furniture or other objects on either side of her as she approaches to speak to me.

All stages of dementia may be met with in epileptics, but even when it is deep there is a tendency to impulsive violence. The speech is characteristic,

being laboured and the tone often monotonous or sometimes querulous.

Post-mortem, examined macroscopically, the brain of the epileptic may present no abnormality, but several observers have found that an important difference in the weight of the two hemispheres is often present. All of us who have examined the brain after death in the status epilepticus are familiar with the intense conjestion, oedema, and flattening of the convolutions generally present. Microscopically, Mott has found very profound structural alterations, of the character of a rapid, acute, and almost universal primary degeneration of the nerve cells.

In long standing cases, Ford Robertson describes how the pia-arachnoid is slightly thickened and milky, and mentions that there is some general atrophy of the brain on macroscopic examination. Microscopically he describes changes in the neuroglia, evidence of old haemorrhages of small size and, in cases in which there has been dementia, diminution in the number of nerve cells.

Let us now consider the all important subject of the treatment of epilepsy. Brower[9] recommends (speaking of sane epileptics) that this should be disciplinary, pedagogic and dietetic, that all stimu-

lating narcotics should be eschewed, differential care for the dullard, and the over bright should be carried out, and the diet should tend to minimise nitrogeneous food and exclude all indigestible foods and cut down fat and sugar. Osler wisely points out that as epilepsy is generally incurable, it should interfere as little as possible with a child's education, as it is much better for epileptics to have some definite pursuit. The value of epileptic Colonies in this connection I have already referred to. The dietetic treatment of the sane or insane epileptic does not differ. Most authorities lay down the rule that the nitrogenous element in the diet should be reduced, meat being allowed only once a day.

Haig advanced the theory that all epileptics should become vegetarians. Studying epilepsy from the point of view of the pathologeral chemist Agostini is entirely opposed to this idea. He states that a purely vegetable diet gives worse results in regard to fits than a purely meat diet, and this he attributes to the fact that vegetable albumin putrefies more readily than animal albumin, and is thus more likely to give rise to toxines. He recommends a mixed diet and plenty of milk.

From practical experience I have found that some plethoric epileptics are better without any meat; the majority may partake of it once a day without any deleterious effect, while a very few weak and anaemic patients may require it, or some other nitrogenous element in their diet, more often to maintain their general health.

Asylum patients are less quarrelsome and more tractable generally when not allowed any alcohol as an ordinary beverage. Agostini[10] advocates the use of small doses of alcohol to help the activity of processes of oxidation and of normal tissue changes in general, which he believes are deficient in epileptics.

The Toulouse-Richet method of treatment consists in the reduction of the chloride of sodium in the food (by an appropiate diet) during the time that bromides are being administered. Their theory is that under these conditions the bromide can substitute itself for the chloride of sodium in the tissues, and hence, by a more intimate contact, influence more powerfully the cell activities. Cappelletti and D'Ormea[11] placed twenty patients on this diet, who were taking from 45 to 120 grs. of Bromide per diem. The latter dosage is, in my opinion, too large for patients undergoing this treatment.

Their conclusions regarding this diet were, that

it is undoubtedly efficacious with regard to the number, severity, and duration of the convulsive seizures, it produces no appreciable harm, the psychical condition is often improved and the general nutrition is so in the majority of cases, no further improvement in the latter being noticed on a return to a diet including chlorides, and, when this change was made even suddenly, there was no exacerbation of the convulsive attack, while the general improvement noticed was not done away with at all events for some time. Halmi and Bargaras[12] have recently tried this treatment in fifteen cases, with results that may be described as negative, but as Harrington Sainsbury points out the lines of their experiments do not appear to have been very judiciously laid down. They deny any curative value to the method, but admit that it does develop the action of the bromides which is all that Toulouse and Richet claim for it, in fact, they ascribe two deaths which occurred among the fifteen patients who underwent this treatment to this over action. The originators of this mode of treatment, however, are careful to recommend the reduction of the dose of bromide when passing from a full saline dietary to one which is hypochlorised.

In the few cases in which I have been able to

employ this method of treatment it certainly developed the action of the small dose (gr. 10) of bromide of sodium which was given to a marked degree. One patient, a poorly nourished female, gained flesh rapidly under this treatment and expressed herself as feeling better than she had done for many years previously. These results I attribute not only to the special diet which she received, but also to the less depressing effects of the very small doses of bromide (compared with those which she had been previously taking) with which one was able to control her epileptic attacks. Knowing that "salt is good" and that it has not "lost its savour" she, like others, complained bitterly at first of the deprivation of the common flavouring element in all her food.

No objection to the treatment occurred on the part of any of Cappelletti and D'Ormea's patients.

This, I think, was due to the vast superiority of the ordinary cooking on the Continent compared to the so-called "plain" cooking in this country in which salt is almost the one and only flavouring agent.

We can readily understand, therefore, why its absence would be more keenly felt by our patients.

We may comfort ourselves by the thought that "Ye are the salt of the earth" applies more particularly to the British nation than to almost any other.

Owing to the fact that every meal of a patient would have to be singly and especially prepared and therefore practically always taken at home, this treatment, in private practice, would present so many difficulties as to make it impracticable in the great majority of cases of epilepsy.

Organo-therapy in epilepsy has attracted attention of late years. Some years ago I made investigations into the treatment of this disease in the insane by didymin and cerebrinin extracts, the results of which appeared in the "Lancet" May 20 1899, and were, I think, the first to be published in this country of treatment by these particular extracts in such cases. According to Poehl the testes contains an active principle, an animal alkaloid or base of a leucomaine nature called spermine, which is said to be a powerful oxidising agent and to be present in the semen, blood, thyroid and pancreas.

Briefly stated ten male epileptics were treated by 5 gr. tabloids of extract of didymin three times a day. Five had a fewer number of fits during the month after treatment as compared with the preceding month, but taking the total number of epileptic seizures of the 10 patients under treatment, the figures become 100 to 99. Eight patients gained in

weight which was probably due to the rest in bed and the extra diet they received, and the physical reaction not being marked, the temperature reaching 100^{o} F in only one case. The mental disturbance was very evident in nearly all these cases. One patient, the subject of epileptic dementia, who had not spoken for some years and who had lived more or less in a state of hebetude, became quite garrulous and observant for several weeks. Others grew excited, quarrelsome and pugnacious, and laboured under hallucinations of sight and hearing to a greater extent than before treatment.

The brain is known to contain a number of most complicated combinations, such as lecithins, protargon, cephalin and the cerebrosides. The latter possess the character of glucosides and include cerebrin (phrenosin) $C_{70}H_{140}N_{2}O_{13}$.

Four female epileptics were treated by cerebrinin tabloids, the treatment and dosage being the same as those followed when using didymin extract. In the first case the physical reaction was not marked, but there was some digestive disturbance. The treatment was continued for fifteen days during which time she became more excited and had marked hallucinations of hearing. Taking a corresponding

period before and after the treatment there was a slight increase in the number of fits. Three more cases similarly treated proved no more successful. In the fourth case the patient had a greatly increased number of fits, subsequently becoming acutely maniacal; she had been resident in the asylum for eight years and had always been quiet, orderly and well behaved. After these unwished for results I abandoned the use of this particular extract.

Up to the present time (April 1904) this patient has had no return of the acute mania and is now undergoing the Toulouse-Richet treatment with some apparent benefit.

Two or three years after the publication of these results I read that M. Lyon,[13] of Samara, Russia, had been much more successful and had obtained remarkably rapid and lasting curative effects by the administration of cerebrium - Poehl. This he employed on theoretical grounds - the toxic origin of the morbid process, and the antitoxic power of healthy nerve elements.[14] Dangerous patients, he says, became docile and tractable, while the melancholy and stuporose resumed their normal mode of thinking. I, therefore, determined to give cerebrium-therapy another trial using only (as was done by Lyon) the preparations manufactured by Professor Poehl in his

laboratory at St. Petersburg.

Five female and one male epileptic were treated after the manner laid down by Lyon. All these patients were given two cerebrinum-Poehl tabloids three times a day, each tabloid containing 0.3 grms. of this extract. In a later communication Lyon recommended that the whole dose of 1.8 grms. should be given at one time in the early morning whilst the patient was fasting. He began by giving this dose every third day, then every second and then daily if necessary. He also in some of his cases gave the liquid extract subcutaneously.

The following are my results, the high price of these preparations (notwithstanding that Professor Poehl's agents kindly supplied me with some hundreds of tabloids and several ampullae for hypodermic use, free of charge)prohibiting in my case a more extensive or prolonged use.

Case I. A female patient, 16 years of age on her admission in 1901. Her parents were of drunken habits. For a short time she is said to have earned her living as a domestic servant, but has always been regarded as of feeble intellect. For the last four years before her admission she was an inmate of the workhouse and during this time began to have fits which

have gradually become worse. She is of an affectionate disposition taking a great interest in her younger brothers and sisters, and during her residence here she has been tractable and orderly and worked industriously at the laundry when able to do so. She was placed on this treatment on Aug. 19th 1903. A careful record of the number of her fits during the preceding month shewed them to have been 115 of varying severity.

During the following month, while under treatment, her fits numbered 91. At first they were of a milder type, but afterwards became very severe, and it was found advisable to stop the administration of these tabloids during the second month of treatment. At first they caused the patient to be more excited, irritable and quarrelsome, but afterwards when her fits had become more frequent and severe she became quite demented and very helpless, dirty in her habits and had to remain in bed. During this time she was given Sod. Bromid. gr. 20 ter in die when much convulsed. At the present time some six months after the treatment was abandoned, her mental condition is much the same as before it was commenced. Lyon says that an apparent increase in the number of attacks is probably due to an individually insufficient

saturation with cerebrinum, but I felt in this case that to proceed with the treatment was to endanger the patient's life.

Case 2. A female patient, of no occupation, admitted in 1891, when 35 years of age. She had been subject to epileptic fits for the previous 16 years. She is of a good tempered and cheerful disposition and very garrulous, sly and deceitful, and occasionally spiteful towards her fellow patients. Helps in the ward with the household duties, but is mischievous and untrustworthy at times and will conceal or throw away various articles with the object of causing alarm or annoyance. She would seldom pass a week without having a fit; as a rule they occurred every few days and were of a severe type. She commenced to take these tabloids on Sept. 1st 1903. During that month she had 11 fits, which was rather below her monthly average number. She expressed herself as feeling very "queer" in her head and hardly to know what she was doing. During the early part of the next month she had fits daily (26 in all) up to the 19th. After this she began to improve mentally, became much quieter and generally better conducted. She was not so sly and mischievous and employed herself more industriously than was her wont. She was

free from fits until Nov. 8 on which day she had six seizures and was given Pot. Bromid. gr. 30. Two days afterwards she had a like number similarly treated and then no fit for 17 days, when she had a solitary seizure and another 11 days later. As she had been taking two 0.3 grms. Cerebrinum-Poehl tabloids three times a day for over three months (receiving 181.2 grms. in all) their administration was now stopped.

Patient then became not so well again mentally and her fits slightly increased in number. She asked that she might be given some more of the "little sweets which tasted like mushrooms" (referring to the tabloids) as she felt much better when taking them. This wish was complied with. During the following month (January 1904) she had 8 seizures and again shewed some mental improvement, although on the 27th she was given three doses of her Bromide mixture to allay excitement and restlessness following a fit. During the first twelve days of the following month she had 18 fits. She then ceased to take this extract, having received 258.6 grms. in all. Her bodily health improved under this treatment and she gained flesh. At the present time (April 1904) her fits are more numerous and her mental condition not so satisfactory as during the time that she was under treatment.

Case 3. A married woman 23 years of age on admission in April 1900. Married for 2 years. No issue. Began to have fits soon after her marriage. She was a fairly nourished woman with a pale complexion and anxious expression. She had twice attempted suicide by drowning a few days before her admission, but only, she stated, to frighten her family. On admission she appeared dazed and at that time had no recollection of what had occurred during the last few weeks. The first week of her residence here she had several severe epileptic fits. She was then given a mixture containing Pot. Bromid gr. 30 Chl. Hyd. gr. 10 ter in die. For three years she continued to be a troublesome epileptic, ultra religious, suspicious, irritable and querulous; at times she became spiteful and pugnacious, assaulting her fellow patients. During this time she lost flesh considerably. Her fits were frequent and consisted of both the petit and grand mal.

Treatment by these tabloids was commenced on Oct. 5th 1903 and a mixture containing Sod. Bromid gr. 20 was substituted for that of Pot. Bromid & Chl. Hyd. She was entirely free from any seizure until the 14th when she had a slight attack of petit mal followed by one similar attack on the next day. On the 17th she had two attacks and next day 14 attacks and 5 during the follow-

ing night. The day after she had two attacks and then no further seizure for a period of three months and a half. On Jan. 31st 1904 she had a slight attack of petit mal. She had never before during her residence here been free from fits for more than a week or two together. Soon after the commencement of this treatment she began to steadily improve bodily and mentally. She gained considerably in flesh, ate with better appetite, worked cheerfully and industriously (she had never employed herself regularly before, saying that she was too weak) was sociable and good natured with her fellow patients, in fact, a complete revolution seemed to have taken place in her moral nature.

But, unfortunately, this improvement proved to be a transitory one for, being so well, she was allowed to discontinue her Bromide mixture on March 4th and a few days later Beelzebub again entered into her and the second state of this woman became almost worse than the first. As above stated she, however, had no epileptic seizure of any kind until an attack of petit mal on Jan. 31st 1904. She was under treatment by these tabloids for three months. At the present time she has had no fit for over a month, but her mental condition has certainly not benefited permanently by this treatment.

Case 4. A pale, anaemic girl admitted Dec. 15th 1900 aged 18, epileptic since childhood and never able to earn her own living. Her mother was also epileptic and was afterwards admitted as a patient here where she died.

The daughter was very dull and stupid, and simple and childish in her manner, smiling fatuously when addressed. Although she visited her mother frequently during her last illness and saw her a short time before her death at her own request, that event affected her but little. She was very spiteful when having fits, but never excited or noisy. She occasionally helped in the kitchen, but was not regularly employed.

She began to take these tabloids on Oct. 6th 1903. On the 20th, 21st and 22nd of that month she had 2, 3 and 6 fits respectively and then no other seizure during her time of treatment, which ceased on Jan. 4th 1904. She had never before since her residence here been free from fits for more than a few weeks together. While under treatment she gained flesh considerably and I had never known her to be so well both bodily and mentally. She became brighter and more cheerful and worked usefully in the main kitchen, the improvement in her mental and bodily condition being frequently

referred to by the cook under whom she worked, who had known her from childhood. I began to hope that in her case some permanent good would result from this treatment as the improvement took place entirely without the help of bromides. Such hopes, however, were doomed to disappointment for on Jan. 21st she had an attack of petit mal and then her epileptic seizures became more and more severe, until on the 29th she lay in a status epilepticus. She remained in this condition for 36 hours, but after treatment by enemata of Chl. Hyd. $\bar{c}$ Pot. Bromid she slowly regained consciousness. She has only had one slight attack of petit mal (on March 10) since February last and at the present time she is perhaps a little brighter than before she underwent this treatment, but there is no marked mental improvement.

Case 5. A carpenter, aged 37, admitted Feb. 13th 1898. He had been epileptic for some years having been under treatment here for epileptic mania for some months in 1895.

He was a slightly made, nervous individual with a weak and watery eye, a festinant gait, an ultra-polite yet familiar manner, much given to gesticulation and attitudinization. At times he was subject to attacks of acute mania following an epileptic

seizure and was then very violent.

He came under treatment by these tabloids on Oct. 18 1903 and continued to take them in the usual dosage for the next three months. For some months before and during the whole time of treatment he was given no bromides. During the month preceding treatment he had had 20 fits by day and 2 by night of varying severity. The following month his fits numbered 25 diurnally and 5 nocturnally and 20 and 4 respectively during the second month. During the last month of treatment his seizures were 17 by day and 4 by night.

For the first few weeks, when taking these tabloids, his fits increased in severity and he became rather more excited, but at no time was there any marked change in his mental condition. At the present time the results of treatment in his case may be said to have been negative.

Case 6. A domestic servant admitted Dec. 5th 1903 aged 22 years. She had been epileptic since the age of 12 years and for six months before her admission here had been an inmate of an epileptic home. During this time her alienation had become more and more marked and latterly she had been very violent. She is the case of epilepsia procursiva that I have before

referred to. During the first month of her residence here she had 18 attacks of haut mal and 26 of petit mal. On Jan. 1st 1904 treatment by cerebrinum-Poehl tabloids was commenced and during that month her seizures numbered 6 of the former and 31 of the latter form of epilepsy, a marked decrease in the attacks of haut mal. Unfortunately in the middle of February she fell in a fit and severely cut her head, necessitating her removal to the infirmary ward when this treatment was discontinued. During the first half of that month she had 20 seizures mostly of the minor form of epilepsy. Whilst she was taking these tabloids her mental condition was quite unchanged, and has since remained so. Her epileptic seizures also continue of much the same nature and frequency, as before treatment.

To summarise my results after following this treatment, in Case 1 it had to be abandoned owing to its markedly injurious effect upon the patient; in Case 2 there was improvement during the time of treatment only; in Case 3 a marked temporary improvement; in Case 4 also a marked temporary improvement and perhaps a slight improvement of a more lasting nature; in Case 5 the results were negative and also in Case 6, but in the latter case the treatment had to be discontinued after six weeks' trial

owing to an accident.

Lyon at first advocated the use of cerebrinum-Poehl for several months with short intermissions, but in some of his later reported cases he continued its use for a year.

Sinkler points out that epileptic seizures may disappear for long periods - two to twenty-nine years. One may be forgiven for thinking that a patient who has had no epileptic seizure of any kind for 29 years is cured, but I agree that it is futile to try to demonstrate the curative value of drugs in this disease by observations extending over periods of three or four months or even one year.

Thyroid extract has been advocated by some in the treatment of epilepsy. Cerf[15] reports four cases of epilepsy treated by thyroid with such excellent results that he suggests that in all cases of so-called essential or idropathic epilepsy some form of thyroid-therapy should be instituted in the event of there being some thyroid dystrophy in the case.

In the cases in which I have tried this extract I have never found the results to be beneficial and in the majority they were positively harmful.

Serum-therapy in epilepsy was advocated by Ceni[16] in a paper published by him in November 1901.

It is unnecessary here to detail his experiments, suffice it to say that his chief theory was that the blood serum in epilepsy contains a specific stimulating substance, to which were due the good effects noted.

In the following year Roncoroni[17] adversely criticised these experiments and theories; in his cases the results of serum-therapy in epilepsy being entirely negative. A year later Sala and Rossi[18] found that their results were entirely in agreement with those of Roncoroni, and about the same time Catola[19] recorded similar results, although his seven cases were carefully selected so as to make them as favourable as possible from Ceni's point of view. The last named author[20] published in the same year a preliminary note on the results of further experiments which he has undertaken in the investigation of the properties of the blood-serum in epilepsy.

Most physicians will agree that even at the present day a bromide is our sheet-anchor in the treatment of most cases of epilepsy.

Gilles de la Tourette in his work on the practical treatment of epilepsy, says that the size of the dose should be determined by the age of the patient, his individual tolerance of the drug and the

number and intensity of the epileptic manifestations.

A useful mode of administration to establish this individual dose, and one which I have lately followed, is that advanced by Charcot, viz. to give the patient in periods of three weeks a dose which rises and falls as follows:- During the first week the daily dose is say 3 grms., the next week it will be 4 grms., and the third week 5 grms. The fourth week is re-started with 3 grms., the fifth with 4 grms. and so forth; the sequence proceeding 3, 4, 5 - 3, 4, 5 indefinitely. During the third or fourth week of maximum dosage a sufficient number of grains of bromide, which may vary in individual cases, should be given to produce a certain degree of lassitude and of somnolence and in addition the "pupil symptom", the pupils re-acting neither to light or accommodation, and being, moreover, at their maximum of dilatation.

Loss of palate reflex is one of the earliest indications that the system is under the influence of a bromide. The largest dose whatever that may be in any individual case will exceed its predecessor by 1 grm. and the dose before that by 2 grms. - the common difference in every series being 1 grm.

In children a grain for each year of their life, not exceeding 20 grs. of Sod. Bromid t. i. d. for an adult, may be given (Brower).

Probably that of sodium is the least irritating of the bromides and will be found to be best borne for a lengthened period of time, but I think it is preferable to vary their administration by changing the vehicle. Clouston recommends that equal parts of the salts of bromide of sodium and of potassium should be given, whilst other physicians also add the bromide of ammonium. Bromide of strontium I have never found to possess any marked superiority to the more commonly prescribed bromides, but it is a fashionable drug with some physicians.

In anaemic patients bromide of iron may be used, but in some cases I have found that the bromide of soda or potash, given with Parrish's Chemical Food is better borne by the stomach.

The occurrence of acne (no indication of bromism) may be guarded against, Seguin says, by giving the drug largely diluted with alkaline waters, and by administering full doses of arsenic from time to time. In my opinion it is preferable to give 1 or 2 m doses of Liq. Arsenicalis with each dose of Bromide.

Bromipin (a combination of Bromide and Sesame oil) may be used as an alternative to the usual Bromides, particularly with advantage where there is

irritability of the bladder. Its oily basis gives it a nutritive value in addition to its medicinal value, due to the Bromide element. Large doses should be given in enemaform, but Kothe[21] recommends the following formula for administration, per os:- Bromipin (10%) 3iiij. : the yolk of two eggs: emulsify and then add - Cognac 3j.: menthol grs 2½. Three or four tablespoonfuls to be taken daily.

In cases where the bromide treatment has failed, borax (10 gr. t. i. d.) may be tried. I have found this to be a useful drug in some cases. Oxide of Zinc in doses of 3 to 5 grs. or Strychnine may be of service. Santonin in increasing doses has been recommended and Nitroglycerine is helpful at times, particularly in petit mal. Gowers states that some fits of deliberate onset may be arrested by Nitrate of Amyl. The addition of Belladonna, when bromide was being administered, was strongly advocated by Black of Glasgow. Brower suggests that combinations of salicylate of soda and antipyrin should be tried, should the bromides disagree. Coal tar preparations have been used by some in this disease. Chloral Hydrate is a most valuable drug in the treatment of the epileptic insane. Cannabis Indica I never now prescribe as I have found its ef-

fects on the bodily health to be most injurious when its administration was continued for any length of time. Opium may be used with advantage in certain cases. Many authorities are, however, much opposed to its use in this disease. A hypodermic injective of 3 to 5 m. of a $\frac{1}{4}$ % solution of the hydrobromate of hyoscin has frequently proved in my experience to be very useful in cases in which there is marked pre or post paroxysmal excitement and violence.

Counter irritation by setons and blistering is now rarely resorted to. If a blister be applied to, or a ligature tied tightly round a limb, finger or toe in which a marked and constant aura always begins, it may serve to stop a fit of deliberate onset.

The surgical treatment of epilepsy need only be briefly referred to. In Jacksonian epilepsy its propriety is now generally acknowledged. In traumatic epilepsy where the convulsive seizures have followed after a fracture of the skull, much good may be done by operative interference. In idiopathic epilepsy Horsely and others have removed the centre controlling the movements of a particular part in which a fit invariably starts.

The removal of certain exciting causes of convulsions, such as an undescended testicle or a

tight prepuce has already been referred to.

The prognosis in epilepsy in the case of both the sane and insane is grave, although, of course, it is much more so in the case of the latter. In the former the most hopeful cases are those which are due to syphilis or alcohol, local affections of the brain and some traumatic cases in which recovery may take place from a brain injury with or without operation. Epileptics, like other sufferers from a serious nervous disease, should be forbidden to marry. On this subject I have written elsewhere.[22]

The fits sometimes cease spontaneously, and Osler points out that this is particularly noticed in the epilepsy in children which has followed the convulsions of teething, or the fevers.

In the case of the latter (the insane) it must be remembered that they are the worst cases of the disease, which find their way into an asylum.

Twenty years ago Clouston found that during ten years 24% of his epileptic patients were discharged recovered of their epileptic insanity, and with the epilepsy itself greatly modified after treatment with bromides.

My own experience during the last ten years has been that a much less percentage than this ever

recover sufficiently to be allowed their liberty. During the last 5 years of 49 men and 45 women admitted to this Asylum suffering from epileptic insanity, only 6 men and 3 women have been discharged as recovered or relieved.

In conclusion, although we may do much to control, and lessen the prevalence of this direful malady, I fear that, notwithstanding the bright hopes and bold statements of the auto-intoxicationists and the organo - and serum - therapists, unless we succeed in entirely eradicating the neurotic diathesis, epileptics, like the poor, will be always with us.

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